

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Henk Mosseveld et al.

Serial No.: 10/551,109

Filed: June 29, 2006

For: USE OF POLYMERS FOR STARCH MODIFICATION

Attorney Docket No.: WAS0726PUSA

Group Art Unit: 1796

Examiner: Karuna P. Reddy

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Sir:

This is an Appeal Brief from the final rejection of claims 20-39 of the Office Action mailed on April 30, 2010, hereinafter "the instant Office Action", following a Notice of Appeal timely filed on July 15, 2010.

I. REAL PARTY IN INTEREST

The real party in interest is Wacker Chemie AG, an organization organized and existing under the laws of Germany, and having a place of business in Hanns-Seidel-Platz 4, Muenchen, Germany 81737, as set forth in the assignment recorded in the U.S. Patent and Trademark Office on October 1, 2008 at Reel 021603 / Frame 0608, and on August 17, 2006 at Reel 018125 / Frame 0429.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to the Appellant, the Appellant's legal representative, or the Assignee which may be directly affected or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 20-39 are pending in this application. Claims 20-39 have been rejected and are the subject of this appeal. Claims 1-19 have been canceled.

IV. STATUS OF AMENDMENTS

A response with amendments directed to an Office Action of July 23, 2009 was filed on October 22, 2009 and has been accepted for entry pursuant to the Office Action dated November 5, 2009. No further amendments have been introduced thereafter.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The application has two (2) independent claims: claims 20 and 39.

The invention of claim 20 pertains to a starch molding composition including optionally modified starch combined with redispersible powder of at least one polymer stabilized with protective colloid(s) and/or emulsifier(s) (Abstract; lines 17 to 32 on page 2, and lines 6 to 29 on page 12 of the original specification; and original claim 20), the polymer containing one or more comonomer units selected from the group consisting of vinyl esters of straight-chain and branched alkylcarboxylic acids having 1 to 18 carbon atoms, acrylates and methacrylates of branched and straight-chain alcohols having 1 to 15 carbon atoms, dienes, vinylaromatics and vinyl halides (Abstract; line 17 on page 2 to line 22 on page 3, and lines 6 to 29 on page 12 of the original specification; and original claim 20), and further containing from 0.1 to 20.0% by weight, based on the total weight of the polymer, of at least one functional comonomer selected

from the group consisting of carboxyl-, hydroxyl-, epoxy- and NH-functional ethylenically unsaturated comonomers, hydroxyalkyl methacrylates wherein the alkyl moiety of the hydroxyalkyl group is a C₁- to C₈-alkyl radical, and optionally, olefin comonomer(s) (Abstract; line 17 to 32 on page 2, line 24 on page 3 to line 22 on page 4, and lines 6 to 29 on page 12 of the original specification; and original claim 20), wherein the redispersible powder of the polymer is present in an amount of from 5 to 60% by weight based on the total weight of the starch (line 34 on page 8 to line 7 on page 9, and lines 6 to 29 on page 12 of the original specification).

Claim 31 further limits the invention of claim 20 by requiring the molding to be prepared by extrusion, extrusion blow molding, foam extrusion, injection molding, calendering or thermoforming (lines 21 to 28 on page 9 of the original specification; and original claim 31).

Claim 36 further limits the invention of claim 20 to a process of providing starch, mixing the polymer with the starch, and molding at a temperature of from 70°C to 150°C (line 30 on page 9 to line 5 on page 10 of the original specification; and original claim 36).

The invention of claim 39 pertains to a starch molded article of optionally modified starch combined with a redispersible powder containing a polymer stabilized with protective colloid(s) and/or emulsifier(s) (Abstract; lines 17 to 32 on page 2, and lines 6 to 29 on page 12 of the original specification; and original claim 20), this polymer containing one or more comonomer units selected from the group consisting of vinyl esters of straight-chain and branched alkylcarboxylic acids having 1 to 18 carbon atoms, acrylates and methacrylates of branched and straight-chain alcohols having 1 to 15 carbon atoms, dienes, vinylaromatics and vinyl halides (Abstract; line 16 on page 2 to line 22 on page 3, and lines 6 to 29 on page 12 of the original specification; and original claim 20), and further comprising from 0.1 to 20.0% by weight, based on the total weight of the polymer, of at least one functional N-methylol comonomer (lines 16 to 22 on page 4 of the original specification; and original claim 23),

wherein the redispersible powder of the polymer is provided in an amount of from 5 to 60% by weight based on the total weight of the starch (line 34 on page 8 to line 7 on page 9, and lines 6 to 29 on page 12 of the original specification).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 20-27, 29-31, 34-37 and 39 stand rejected under 35 U.S.C. § 103(a) over Ritter, et al., USPN 5,439,953, hereinafter "*Ritter*", in view of Wendel et al., USPN 5,358,998, hereinafter "*Wendel*".

B. Claim 32 stands rejected under 35 U.S.C. § 103(a) over *Ritter* in view of *Wendel* and further in view of Miyamoto et al., JP 2002-020601, hereinafter "*Miyamoto*".

C. Claim 28 stands rejected under 35 U.S.C. § 103(a) over *Ritter* in view of *Wendel* and further in view of Famili et al., USPN 5,362,778, hereinafter "*Famili*".

D. Claims 33 and 38 stand rejected under 35 U.S.C. § 103(a) over *Ritter* in view of *Wendel* and further in view of Hashemzadeh et al., US 2002/0135086, hereinafter "*Hashemzadeh*".

VII. ARGUMENT

Claim 20 recites a starch molding composition including optionally modified starch combined with redispersible powder of at least one polymer stabilized with protective colloid(s) and/or emulsifier(s), the polymer containing one or more comonomer units selected from the group consisting of vinyl esters of straight-chain and branched alkylcarboxylic acids

having 1 to 18 carbon atoms, acrylates and methacrylates of branched and straight-chain alcohols having 1 to 15 carbon atoms, dienes, vinylaromatics and vinyl halides, and further comprising from 0.1 to 20.0% by weight, based on the total weight of the polymer, of at least one functional comonomer selected from the group consisting of carboxyl-, hydroxyl-, epoxy- and NH-functional ethylenically unsaturated comonomers, hydroxyalkyl methacrylates wherein the alkyl moiety of the hydroxyalkyl group is a C₁- to C₈-alkyl radical, and optionally, olefin comonomer(s), wherein the redispersible powder of the polymer is present in an amount of from 5 to 60% by weight based on the total weight of the starch.

Ritter is directed to starch digestion effected by the concomitant use of polymer in the aqueous phase (Abstract; col. 3, lines 31-39). In particular, *Ritter* is concerned with thermo-mechanical starch digestion at elevated pressures and temperatures and with the addition of water (Abstract). The polymer is employed in the form of aqueous dispersions containing the synthetic polymer material in an aqueous phase (col. 4, lines 1-5). The aqueous polymer emulsion has a water content of from 40 to 65% by weight (col. 6, lines 1-6). The starch digestion is carried out at temperatures from 100°C to 170°C (col. 6, lines 56-59). The Examiner admits that *Ritter* does not teach the use of a polymer in powder form much less the use of the polymer in redispersible powder form as required in the claims. *See* page 2 of the instant Office Action in view of page 3 of the Office Action dated November 5, 2009. At least for this reason, the Examiner has withdrawn previously asserted anticipation claim rejections over *Ritter*. *See* page 8 of the Office Action dated July 23, 2009.

Wendel is directed to an aqueous polymer dispersion which employs sugared starch as a surfactant to stabilize the aqueous dispersion (col. 1, lines 13-23). The resultant aqueous polymer dispersions are suitable for use as adhesives, as binders for carpet backings, and as binders for paper coatings (col. 8, lines 26-37). The resultant aqueous polymer dispersion is provided with increased flowability and a long shelf life (col. 8, lines 65-68). The aqueous nature of *Wendel's* polymer dispersion is further supported in his disclosure at lines 29-30 in col. 9

wherein the dispersion is stated to have solids content of 40% to 60% by weight and hence a water content of 60% to 40% by weight. It should be particularly noted that to form the aqueous polymer dispersion, *Wendel* uses primarily water or a mixture of water and water-miscible liquids such as methanol such that emulsion polymerization of the comonomers can be carried out (col. 7, lines 3-6). For instance, *Wendel's* dispersion in Example 1 contains 513g water out of a total dispersion weight of 732g, or a weight percentage of 70% of water (col. 12, lines 37-42), 65% of water in preparations D₁₁-D₁₃ (col. 13, lines 23-30), and 51% of water in preparation D₁₄ (col. 14, lines 13-18).

In particular, Table 7 of *Wendel* makes reference to a starch-to-polymer weight ratio of 40%, or a polymer-to-starch weight ratio of 250%. *See* col. 12, lines 32-36. This ratio is consistent with *Wendel's* disclosure of a general starch-to-polymer weight ratio of 1 to 120%. *See* col. 6, lines 14-18 in col. 6. Therefore, *Wendel* teaches a polymer-to-starch weight ratio of 100/40 or 250%, a ratio completely outside the claimed range of 5 to 60%. At least for this reason, the Examiner has withdrawn previously asserted anticipation claim rejections over *Wendel*. *See* page 6 of the Office Action dated November 5, 2009.

A. *Claims 20-27, 29-31, 34-37 and 39 Are Patentable Under 35 U.S.C. § 103(a) Over Ritter and Wendel*

1. *Claim 20*

Claims 20-27, 29-31, 34-37 and 39 stand rejected under 35 U.S.C. § 103(a) over *Ritter* and *Wendel*. *See* page 2 of the instant Office Action. For at least the following reasons, reversal of this rejection is respectfully solicited.

As stated herein, independent claim 20 recites a starch molding composition including a redispersible polymer powder and optionally modified starch, with a polymer/starch weight ratio of 5% to 60%. Molding articles derived from the claimed starch molding compositions are provided with improved water resistance and increased article strength (lines 17 to 29 on page 12, and line 30 on page 15 to line 5 on page 16 of the original specification).

a) *Ritter Cannot Be Modified In View Of Wendel*

The Examiner admits that *Ritter* does not teach dry polymer powder in a starch composition and argues, however, that *Ritter* can be modified to use dry polymer powder in view of *Wendel*. See page 3 of the instant Office Action in view of page 3 of the Office Action dated November 5, 2009. Appellant submits, for at least the reasons set forth below, that *Ritter* cannot be modified as suggested by the Examiner.

Ritter is concerned with how to digest starch in one thermo-mechanical step, while making the digested starch less hydrophilic and more hydrophobic. See for instance the Abstract and lines 19-29 and 54-56 in col. 1 of *Ritter*. As to increasing hydrophobicity, *Ritter* uses synthetic polymer compounds that are largely water-insoluble to confer water resistance to the digested starch. See for instance lines 52-66 in col. 2. As to simplifying the digestion process, *Ritter* uses a single step method which is carried out by forming a homogenous mixture of starch, water and the largely water-insoluble polymer and plastizing the starch in an extruder under the effects of water. See for instance col. 8, lines 14-23; and col. 14, line 65 to col. 15, line 19. The water necessary for effecting the starch digestion comes from the aqueous polymer dispersion. Therefore, replacing the polymer water dispersion in *Ritter* with a polymer in dry powdery form, as suggested by the Examiner, would deprive the water source necessarily required in *Ritter's* one step digestion process.

On page 4 of the instant Office Action in view of page 7 of the Office Action dated November 5, 2009, the Examiner asserts that *Ritter's* polymer dispersions can be mixed with water, citing to lines 45-50 in column 9, and argues that *Ritter* could use a dry polymer powder and add water to form the polymer dispersions.

As stated herein, that *Ritter* concerns starch digestion in a one step process, wherein the polymers are provided in an aqueous dispersion prior to its admission to the starch digestion mixture. In other words, the final form of the polymers brought into contact with the starch is an aqueous dispersion. *Ritter's* process does not involve a composition which contains both starch and redispersible polymer powder (inherently dry) as recited in the claims. In this regard, whether these dry redispersible polymer powder of *Wendel* may be mixed with water is irrelevant.

Moreover, adding *Wendel's* polymer mixture to *Ritter's* process would frustrate the latter's intended purpose. *Wendel's* polymer mixture contains degradation products of starch as a stabilizer. *See* col. 2, lines 40-46. These degradation products include sugared starches, of which 10 wt% to 70 wt% and preferably 20 wt% to 40 wt% are finely fragmented small molecules having an average molecular weight of no more than 1000. *See* col. 3, lines 42-48. At least due to their small molecular sizes, these starch degradation products are soluble in water at room temperature. Consequently, *Wendel's* polymer dispersion is essentially a homogenized polymer solution stabilized by the starch degradation products such as the sugared starches, wherein phase separation between a water phase and a polymer phase is intentionally and in effect reduced and/or eliminated. *See* also col. 1, lines 13-18.

To the contrary, one of the fundamentals of the *Ritter's* process is the one-step starch digestion wherein the starch is thermo-mechanically digested using the water freely accessible from the aqueous polymer dispersion wherein the polymers are largely water insoluble. In this regard, *Ritter's* polymer dispersion is essentially a two-phase dispersion, formed of a water

phase and a water-insoluble polymer phase. This arrangement is beneficial in that the availability and accessibility of water for starch digestion is potentiated by the water insolubility and hence the water repellence of *Ritter's* polymers.

Ritter's intended purpose of making water in the digestion mixture freely available for the thermo-mechanical digestion of starch would be substantially frustrated if the needed water becomes less available, such as in the case if *Wendel's* polymer mixture is used, wherein the polymers, the water, and the sugared starches are essentially in a homogeneously solubilized state of co-existence.

Furthermore, the impact of *Wendel's* starch degradation products such as sugared starches on *Ritter's* thermo-mechanical digestion conditions is unknown. It is likely that *Wendel's* starch degradation products would unnecessarily complicate *Ritter's* process by competing *Ritter's* starch for the digestion treatment, and/or altering thermodynamics of the *Ritter's* process by virtue of their presence in the digestion mixture.

b) *Ritter And Wendel Are Not Properly Combinable*

Moreover, Appellants submit that *Ritter* and *Wendel* are not properly combinable. It is well established that one cannot simply "pick and choose" isolated teachings from a reference while disregarding other salient features of the reference. *In re Wesslau*, 353 F.2d 238 (CCPA 1965). These "other salient teachings" must be incorporated into any rejection based on a combination of references.

Ritter is all about processing and digesting starch; *Ritter's* digestion mixture in solids form is based on starch; and *Ritter* merely uses polymer as a process additive to confer hydrophobicity to the starch as stated herein above. See also lines 51-65 in col. 5. For instance, as shown in Example 1, *Ritter* teaches a starch-to-polymer weight ratio of about 245% (40.0% for

the potato starch relative to 16.2% for the poly(vinyl acetate); as shown in Example 2, *Ritter* teaches a starch-to-polymer weight ratio of about 217% (40% for the potato starch relative to 18.4% for the poly(vinyl acetate); as shown in Example 3, *Ritter* teaches a starch-to-polymer weight ratio of about 173% (36% for the potato starch relative to 20.8% for the poly(vinyl acetate); and as shown in Example 4, *Ritter* teaches a starch-to-polymer weight ratio of about 151% (40% for the potato starch relative to 26.5% for the poly(Vac/DBM/BA).

Wendel is drastically different from *Ritter* at least with respect to the use of starch and the starch-to-polymer ratios employed. As previously submitted by the Appellants, *Wendel* is directed to processing and modifying polymers; and *Wendel* merely uses starch as a process additive, particularly as a surfactant to stabilize the polymers in aqueous dispersion form. See for instance pages 8-9 of Appellants' Amendment dated May 26, 2009. As stated herein above, *Wendel* uses a starch-to-polymer weight ratio of 1% to 120% which is consistent with *Wendel's* stated purpose of modifying polymer stability in dispersion form and merely uses starch as a surfactant.

These contradicting, features of *Ritter* and *Wendel* are tabulated in Table "I" shown below.

Table "I" - Comparative View of the Salient Features between *Ritter* and *Wendel*

	Directed to Processing and Modification of	Process Additives	Exemplified Starch-to-Polymer Weight Ratios
<i>Ritter</i>	starch	polymer	245%, 217%, 173%, 151%, etc.
<i>Wendel</i>	polymer	starch	1% to 120%

As stated herein, *Ritter* is directed to treatment (digestion) of **starch** using polymer as a hydrophobicity enhancer with a starch-to-polymer ratio well **above 150 %**, wherein *Wendel*

is directed to the treatment (modification) of *polymer* using degraded starch as a stabilizer with a starch-to-polymer ratio at or ***below 120 %***. Contrary to the Examiner's assertions, *Wendel*'s teaching of redispersible polymer powder ***cannot be isolated*** from *Wendel* as a whole, nor can *Wendel* be combined with *Ritter* in total disregard of the above-identified salient features that are drastically different between *Wendel* and *Ritter*.

On page 4 of the instant Office Action in view of page 7 of the Office Action dated November 5, 2009, the Examiner asserts that Appellant' remarks demonstrating the drastic differences between *Ritter* and *Wendel* are not persuasive because according to the Examiner, *Wendel* is ***only*** cited for its teaching of the redispersible polymer powder for ease of handling and storage. The Examiner's assertion is respectfully submitted to be contrary to the well settled law against picking or choosing isolated teachings from a reference while disregarding other salient features of the reference, in accordance with *In re Wesslau* cited previously. Thus, and contrary to the Examiner's intention, *Wendel* cannot be only cited for its isolated teach of some polymer powder in total disregard to *Wendel*'s teachings as a whole.

2. Claim 39

Claim 39 recites a starch molded article comprising optionally modified starch combined with redispersible powder of at least one polymer stabilized with protective colloid(s) and/or emulsifier(s), wherein the polymer contains at least one functional N-methylol comonomer, and wherein the redispersible polymer powder is provided in an amount of from 5% to 60% by weight based on the total weight of the starch.

As stated hereinabove, the cited art fails to teach or suggest at least one of the limitations recited in claim 39. Moreover, the claimed starch molded article can be in the form of pressed sheets having moisture content less than 1% by weight (lines 10 to 24 on page 11 of

the original specification) and can withstand certain fracture test conditions (line 31 on page 12 to line 4 on page 13 of the original specification). The claimed starch molded article can also be in the form of shaped pellets and granules dependent upon particular needs of an application (line 30 on page 13 to line 6 on page 14 of the original specification) that can withstand water-induced disintegration when submerged in water (lines 8 to 14 on page 14 of the original specification). None of these features are taught or suggested in the cited art. Claim 39 is separately patentable.

**B. *Claim 32 Is Patentable Under
35 U.S.C. § 103(a) Over Ritter, Wendel, And Miyamoto***

Claim 32 stands rejected under 35 U.S.C. § 103(a) over *Ritter, Wendel, and Miyamoto*. See page 2 of the instant Office Action. Claim 32 is submitted to be patentable due to its dependency from independent claim 20 which is believed to be allowable for at least the reasons set forth herein in relation to *Ritter* and *Wendel*. *Miyamoto* does not cure the deficiency of *Ritter* and *Wendel*. *Miyamoto* is cited for the alleged disclosure of biodegradable polyester. Reversal of this rejection is respectfully solicited.

**C. *Claim 28 Is Patentable Under
35 U.S.C. § 103(a) Over Ritter, Wendel, And Famili***

Claim 28 stands rejected under 35 U.S.C. § 103(a) over *Ritter, Wendel, and Famili*. See page 3 of the instant Office Action. For at least the following reasons, reversal of this rejection is respectfully solicited.

Claim 28 is submitted to be patentable due to its dependency from the independent claim 20 which is believed to be allowable for at least the reasons set forth herein in relation to *Ritter* and *Wendel*. *Famili* does not cure the deficiency of *Ritter* and *Wendel*. *Famili* is cited for the alleged disclosure of polyvinyl alcohol.

Claim 28 is submitted to be separably patentable due to the additional features recited therein. For instance, claim 28 recites the starch molding composition of claim 20 wherein the protective colloids include polyvinyl alcohols having a degree of hydrolysis of from 85 to 94 mol% and a Höppler viscosity, in 4% strength aqueous solution, of from 3 to 15 mPa·s at 20°C according to DIN 53015. The polyvinyl alcohol is used as a protective colloid to modify certain properties of the starch molding. *See* lines 4 to 17 on page 7 of the original specification.

In contrast, *Famili* is directed to a composition of polyvinyl alcohol itself and uses its own property modifier such as a plasticizer to improve the flow characteristics of the polyvinyl alcohol (col. 3, lines 40-41). *Famili* teaches making an extrudable polyvinyl alcohol composition useful for packaging and molding applications through the addition of thermoplastic modified starch (Abstract). *Famili* teaches that starch modified polyvinyl alcohol is thermally stable and can withstand subsequent melt processing in conventional thermoplastic processing equipment.

Starch-modified polyvinyl alcohol is totally different from starch composition containing a redispersible polymer powder in which the polyvinyl alcohol is a protective colloid for a thermoplastic. Reversal of this rejection is respectfully solicited.

**D. *Claims 33 And 38 Are Patentable Under
35 U.S.C. § 103(a) Over Ritter, Wendel, And Hashemzadeh***

Claims 33 and 38 stand rejected under 35 U.S.C. § 103(a) over *Ritter*, *Wendel*, and *Hashemzadeh*. *See* page 7 of the instant Office Action. Claims 33 and 38 are submitted to be patentable due to their dependency from the independent claim 20 which is believed to be allowable for at least the reasons set forth herein in relation to *Ritter* and *Wendel*. *Hashemzadeh* does not cure the deficiency of *Ritter* and *Wendel*. The Examiner cites *Hashemzadeh* for the alleged disclosure of wood shavings, wood particles, and wood fibers. *Id.* Reversal of this rejection is respectfully solicited.

The Appeal Brief fee of \$540.00 is being charged to Deposit Account No. 02-3978 via electronic authorization submitted concurrently herewith. The Commissioner is hereby authorized to charge any additional fees or credit any overpayments as a result of the filing of this paper to Deposit Account No. 02-3978.

Respectfully submitted,

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Enclosure - Appendices

VIII. CLAIMS APPENDIX

20. A starch molding composition comprising optionally modified starch combined with redispersible powder of at least one polymer stabilized with protective colloid(s) and/or emulsifier(s), said polymer comprising one or more comonomer units selected from the group consisting of vinyl esters of straight-chain and branched alkylcarboxylic acids having 1 to 18 carbon atoms, acrylates and methacrylates of branched and straight-chain alcohols having 1 to 15 carbon atoms, dienes, vinylaromatics and vinyl halides, and further comprising from 0.1 to 20.0% by weight, based on the total weight of the polymer, of at least one functional comonomer selected from the group consisting of carboxyl-, hydroxyl-, epoxy- and NH-functional ethylenically unsaturated comonomers, hydroxyalkyl methacrylates wherein the alkyl moiety of the hydroxyalkyl group is a C₁- to C₈-alkyl radical, and optionally, olefin comonomer(s), wherein the redispersible powder of the at least one polymer is of an amount of from 5 to 60% by weight based on the total weight of the starch.

21. The starch molding composition of claim 20 wherein the one or more comonomer units are selected from the group consisting of vinyl esters of straight-chain or branched carboxylic acids having 1 to 18 carbon atoms.

22. The starch molding composition of claim 20, wherein the at least one functional comonomer includes N-alkylol-functional comonomer units having a C₁- to C₄-alkylol radical.

23. The starch molding composition of claim 20, wherein the at least one functional comonomer is selected from the group consisting of N-methylolacrylamide (NMA), N-methylolmethacrylamide, N-methylolallylcarbamate, C₁- to C₄-alkyl ethers of N-methylolacrylamide, N-methylolmethacrylamide and N-methylolallylcarbamate, and C₁- to C₄-alkyl esters N-methylolacrylamide, N-methylolmethacrylamide and N-methylolallylcarbamate.

24. The starch molding composition of claim 20, wherein the polymer is vinyl acetate polymer, vinyl acetate/ethylene copolymer, vinyl acetate/ethylene/vinyl chloride copolymer or vinyl ester/acrylate copolymer, each further containing said functional comonomer.

25. The starch molding composition of claim 20, wherein the polymer has a glass transition temperature of from -30°C to $+120^{\circ}\text{C}$.

26. The starch molding composition of claim 20, wherein the protective colloid(s) are provided in an amount of from 1 to 30% by weight, based on the weight of the polymer.

27. The starch molding composition of claim 20, wherein the protective colloid(s) are selected from the group consisting of polyvinyl alcohols, polyvinyl acetals, polyvinylpyrrolidones, celluloses, cellulose derivatives, poly(meth)acrylic acid, copolymers of (meth)acrylates with carboxy-functional comonomer units, poly(meth)acrylamide, polyvinylsulfonic acids and copolymers thereof, melamineformaldehydesulfonates, naphthaleneformaldehydesulfonates, styrene/maleic acid copolymers, vinyl ether/maleic acid copolymers, starch₂ and dextrans.

28. The starch molding composition of claim 27, wherein the protective colloids are polyvinyl alcohols having a degree of hydrolysis of from 85 to 94 mol% and a Höppler viscosity, in 4% strength aqueous solution, of from 3 to 15 mPa·s at 20°C according to DIN 53015.

29. The starch molding composition of claim 20, wherein the optionally modified starch is in natural form, as destructured starch, as chemically modified starch, or a mixture thereof.

30. The starch molding composition of claim 20 is an adhesive.

31. A starch molding composition of claim 20, prepared by a molding process of extrusion, extrusion blow molding, foam extrusion, injection molding, calendering or thermoforming.

32. The starch molding composition of claim 31 further comprising biodegradable polyester as a binder.

33. The starch molding composition of claim 31 further comprising cellulose fractions in the form of wood particles, wood fibers and woodmeal.

34. The starch molding composition of claim 31 provided as a rotable molding.

35. The starch molding composition of claim 31 provided as a rotable film.

36. A process for producing a starch molding from the starch molding composition of claim 20, comprising:

providing starch, mixing said at least one polymer with said starch, and molding at a temperature of from 70°C to 150°C.

37. The process of claim 36, wherein water is present prior to molding.

38. The process of claim 36, wherein a wood product selected from the group consisting of wood particles, wood fibers, wood meal, and mixtures thereof are present prior to molding.

39. A starch molded article comprising optionally modified starch combined with redispersible powder of at least one polymer stabilized with protective colloid(s) and/or emulsifier(s), said polymer comprising one or more comonomer units selected from the group consisting of vinyl esters of straight-chain and branched alkylcarboxylic acids having 1 to 18 carbon atoms, acrylates and methacrylates of branched and straight-chain alcohols having 1 to 15 carbon atoms, dienes, vinylaromatics and vinyl halides, and further comprising from 0.1 to 20.0% by weight, based on the total weight of the polymer, of at least one functional N-methylol comonomer, wherein the redispersible powder of the at least one polymer is provided in an amount of from 5 to 60% by weight based on the total weight of the starch.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.